HISTORIC COLUMBIA RIVER HIGHWAY,
BRIDAL VEIL FALLS BRIDGE
Troutdale vicinity
Multnomah County
Oregon

HAER No. OR-36-E

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
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P.O. Box 37127
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HISTORIC AMERICAN ENGINEERING RECORD

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Note: For shelving purposes at the Library of Congress, Troutdale vicinity in Multnomah County was selected as the "official" location for the various structures in the Historic Columbia River Highway documentation.

Jet Lowe, HAER Photographer, July 1995.

HAER No. OR-36-E-1	BRIDAL VEIL FALLS BRIDGE, WESTERN PORTAL LOOKING NORTHEAST. SAME PHOTO AS HAER No. OR-36-33.
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HISTORIC AMERICAN ENGINEERING RECORD

HISTORIC COLUMBIA RIVER HIGHWAY, BRIDAL VEIL FALLS BRIDGE

HAER No. OR-36-E

Location:	Spanning Bridal Veil Creek, along with three lumber-carrying flumes and a dam owned by the Bridal Veil Lumbering Company, near the town of Bridal Veil, Multnomah County, Oregon, on the Historic Columbia River Highway, beginning at milepost 28.4. UTM: 10/564080/5044640 Quad: Bridal Veil, Oreg.--Wash.
Date of Construction:	1914
Engineer:	K. P. Billner, designing engineer, Oregon State Highway Department
Builder:	Pacific Bridge Company, Portland
Owner:	Oregon Department of Transportation
Present Use:	Vehicular and pedestrian traffic
Significance:	Site constraints forced Multnomah County and the Oregon State Highway Commission to select a skewed reinforced-concrete deck girder span for this location. The span's angled bents and its tall and thick parapet walls, which function as elastic beams, make it an atypical structure on the Historic Columbia River Highway.
Historian:	Robert W. Hadlow, Ph.D., September 1995
Transmitted by:	Lisa Pfueller, September 1996

PROJECT INFORMATION

This recording project is part of the Historic American Engineering Record (HAER), a long-range program to document historically significant engineering and industrial works in the United States. The HAER program is administered by the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) Division of the National Park Service, U.S. Department of the Interior. The Historic Columbia River Highway Recording Project was cosponsored in 1995 by HABS/HAER, under the general direction of Robert J. Kapsch, Ph.D., Chief, and by the Oregon Department of Transportation (ODOT), Bruce Warner, Region One Manager; in cooperation with the US/International Committee on Monuments and Sites (ICOMOS), the American Society of Civil Engineers (ASCE), and the Historic Columbia River Highway Advisory Committee.

Fieldwork, measured drawings, historical reports, and photographs were prepared under the direction of Eric N. DeLony, Chief of HAER; Todd A. Croteau, HAER Architect, and Dean A. Herrin, Ph.D., HAER Historian. The recording team consisted of Elaine G. Pierce (Chattanooga, Tennessee), Architect and Field Supervisor; Vladimir V. Simonenko (ICOMOS/Academy of Fine Arts, Kiev, Ukraine), Architect; Christine Rumi (University of Oregon) and Pete Brooks (Yale University), Architectural Technicians; Helen I. Selph (California State Polytechnic University, Pomona) and Jodi C. Zeller (University of Illinois, Urbana-Champaign), Landscape Architectural Technicians; Robert W. Hadlow, Ph.D. (ASCE/Pullman, Washington), Historian; and Jet Lowe (Washington, DC), HAER Photographer. Jeanette B. Kloos, ODOT Region One Scenic Area Coordinator; and Dwight A. Smith, ODOT Cultural Resources Specialist, served as department liaison.

Additional information about the Historic Columbia River Highway can be found under the following HAER Nos.:

OR-36	HISTORIC COLUMBIA RIVER HIGHWAY
OR-36-A	HISTORIC COLUMBIA RIVER HIGHWAY, SANDY RIVER BRIDGE AT TROUTDALE
OR-36-B	HISTORIC COLUMBIA RIVER HIGHWAY, SANDY RIVER BRIDGE (Stark St. Bridge)
OR-36-C	HISTORIC COLUMBIA RIVER HIGHWAY, CROWN POINT VIADUCT
OR-36-D	HISTORIC COLUMBIA RIVER HIGHWAY, CROWN POINT
OR-24	LATOURELL CREEK BRIDGE
OR-23	SHEPPERDS DELL BRIDGE
OR-36-F	HISTORIC COLUMBIA RIVER HIGHWAY, WAHKEENA FALLS FOOTBRIDGE
OR-36-G	HISTORIC COLUMBIA RIVER HIGHWAY, WEST MULTNOMAH FALLS VIADUCT

OR-36-H	HISTORIC COLUMBIA RIVER HIGHWAY, MULTNOMAH CREEK BRIDGE
OR-36-I	HISTORIC COLUMBIA RIVER HIGHWAY, MULTNOMAH FALLS FOOTBRIDGE (Benson Footbridge)
OR-36-J	HISTORIC COLUMBIA RIVER HIGHWAY, EAST MULTNOMAH FALLS VIADUCT (Bridge No. 841)
OR-36-K	HISTORIC COLUMBIA RIVER HIGHWAY, ONEONTA GORGE CREEK BRIDGE
OR-36-L	HISTORIC COLUMBIA RIVER HIGHWAY, ONEONTA TUNNEL
OR-36-M	HISTORIC COLUMBIA RIVER HIGHWAY, HORSETAIL FALLS BRIDGE
OR-49	MOFFETT CREEK BRIDGE
OR-36-N	HISTORIC COLUMBIA RIVER HIGHWAY, TOOTHROCK & EAGLE CREEK VIADUCTS
OR-36-O	HISTORIC COLUMBIA RIVER HIGHWAY, TOOTHROCK TUNNEL
OR-36-P	HISTORIC COLUMBIA RIVER HIGHWAY, EAGLE CREEK BRIDGE
OR-36-Q	HISTORIC COLUMBIA RIVER HIGHWAY, EAGLE CREEK RECREATION AREA (Forest Camp)
OR-36-R	HISTORIC COLUMBIA RIVER HIGHWAY, MITCHELL POINT TUNNEL & VIADUCT (Tunnel of Many Vistas)
OR-36-T	HISTORIC COLUMBIA RIVER HIGHWAY, MOSIER TWIN TUNNELS
OR-36-U	HISTORIC COLUMBIA RIVER HIGHWAY, MOSIER CREEK BRIDGE (Bridge No. 498)
OR-30	DRY CANYON CREEK BRIDGE
OR-27	MILL CREEK BRIDGE
OR-56	COLUMBIA RIVER HIGHWAY BRIDGES

For shelving purposes at the Library of Congress, Troutdale vicinity in Multnomah County was selected as the "official" location for the various structures in the Historic Columbia River Highway documentation (HAER No. OR-36).

HISTORIC COLUMBIA RIVER HIGHWAY

The Pacific Northwest's Columbia River Highway, later renamed the Historic Columbia River Highway (HCRH), was constructed between 1913 and 1922. It is one of the oldest scenic highways in the United States. Its design and execution were the products of two visionaries: Samuel Hill, lawyer, entrepreneur, and good roads promoter, and Samuel C. Lancaster, engineer and landscape architect, with the assistance of several top road and bridge designers. In addition, many citizens provided strong leadership and advocacy for construction of what they saw as "The King of the Roads."

Often, the terms "scenic highways" and "parkways" are used synonymously. Scenic highways are best described as those roads constructed to provide motorists with the opportunity to see up-close the landscape's natural beauty. Parkways are roads or streets often associated with city beautiful campaigns prevalent in the United States in the late 19th and early 20th centuries. They were part of a movement to create park-like settings out of wastelands. Many of the scenic highways in the United States are associated with the country's national park system and were built in the years following the First World War.

Beginning in the 1910s and early 1920s, the National Park Service (NPS) began construction of well-engineered paved roads with permanent concrete and masonry bridges and viaducts to make its park sites more accessible to an increasingly mobile tourist population. These included roads such as "Going-to-the-Sun Highway" in Glacier National Park and "All-Year Highway" in Yosemite National Park. The Historic Columbia River Highway, unlike many of its counterparts, was constructed through county-state cooperation. It became a state-owned trunk route or highway, part of a growing system of roads that criss-crossed Oregon.

Samuel Hill, once an attorney for James J. Hill and his large railroad empire, and later a Pacific Northwest investor and entrepreneur, was the state of Washington's most vocal good roads' spokesman in the late 19th and early 20th centuries. He promoted good roads at Seattle's Alaska-Yukon-Pacific Exposition in 1905, and shortly thereafter helped to establish the department of highway engineering at the University of Washington. With little success in convincing the Washington State Legislature to fund a major highway along the Washington side of the Columbia River, Hill found more receptive ears and pocketbooks with Oregon lawmakers and Portland area businessmen. Construction began on the HCRH in 1913. By 1922, it was

complete, covered in a long-wearing and smooth-riding asphaltic-concrete pavement.[1]

Hill hired Samuel Lancaster, an experienced engineer and landscape architect to design the HCRH. Lancaster was noted for the boulevards that he created around Seattle's Lake Washington in the first decade of the 20th century as a component of the city's Olmsted-designed park system. In 1909 Lancaster became the first professor of highway engineering in Hill's department at the University of Washington. Lancaster had accompanied Hill and others to Paris in 1908 for the First International Road Congress, and afterwards the delegation toured western Europe to learn about Continental road-building techniques. Seeing roads in the park-like setting of the Rhine River Valley inspired Hill to build a highway along the Columbia River Gorge. By 1912, Lancaster was conducting road-building experiments at Hill's estate, Maryhill, 100 miles east of Portland on the Washington side of the Columbia. The route they subsequently created was not a parkway, in the truest sense, but instead a scenic highway.[2]

The Columbia River Gorge's natural features distinguish it as the ideal setting. This relationship between the natural landscape and the Historic Columbia River Highway was described best by locating engineer John Arthur Elliott. He wrote, "All the natural beauty spots were fixed as control points and the location adjusted to include them." The road passed several waterfalls and rock outcroppings, including Thor's Heights (Crown Point), Latourell Falls, Shepperd's Dell, Bishop's Cap, Multnomah Falls, Oneonta Gorge and Falls, Horsetail Falls, Wahkeena Falls, and Tooth Rock. Natural features were made an integral component of the HCRH.[3]

According to Lancaster, "There is but one Columbia River Gorge [that] God put into this comparatively short space, [with] so many beautiful waterfalls, canyons, cliffs and mountain domes." He believed that "men from all climes will wonder at its wild grandure [*sic*] when once it is made accessable [*sic*] by this great highway." In addition, the promoters sought to create a route that utilized the most advanced techniques available for road construction. In reflecting on the work's progress, Lancaster acknowledged that because of the country's rugged climate, with its wind and rain and winter weather, it had been "slow and tedious and somewhat more expensive than ordinary work." Nevertheless, he and his associates felt they were accomplishing a worthwhile task because, "for if the road is completed according to plans, it will rival if not surpass anything to be found in the civilized world."[4]

In an more practical light, many observers saw the HCRH as a lifeline connecting Portland with the many commercial and agricultural areas along the Columbia River. Some even envisioned it as part of a spider web of similarly constructed routes radiating out towards central and eastern Washington and northern Idaho, meeting routes leading to other parts of the region and nation.

The HCRH was a technical and civic achievement of its time, successfully mixing sensitivity to the magnificent landscape and ambitious engineering. The highway has gained national significance because it represents one of the earliest applications of cliff-face road building as applied to modern highway construction. Lancaster emulated the European styles of road building in the Columbia River Gorge, while also designing and constructing a highway to advanced engineering standards. Throughout the route, engineers held fast to a design protocol that included accepting no grade greater than 5 percent, nor laying out a curve with less than a 200' turning radius. In rare cases where a tighter curve was used, Lancaster reduced grades and widened pavement. The use of reinforced-concrete bridges, combined with masonry guard rails, guard walls, and retaining walls brought together the new with the old--the most advanced highway structures with the tried and tested. In building the HCRH, Lancaster artfully created an engineering achievement sympathetic to the natural landscape.[5]

In the days before the formation of a comprehensive state highway plan, Multnomah, Hood River, and Wasco Counties cooperated, sometimes unwillingly, with the newly-formed Oregon State Highway Commission (1913) in constructing the HCRH. Initially, a group of recently elected Multnomah County commissioners, strong supporters of the proposed route, resolved that the highway commission take charge of its road building activities, with access to $75,000 in county tax revenues. Soon crews surveyed the route through Multnomah County and constructed one mile of road.

Boosters stumped for the route's completion to the Hood River County line. Local clubs sent out men and boys for weekend work parties to show public support for the undertaking. One photograph from the period, depicts work parties with picks and shovels in hand and placards such as "Gang No. 7, Portland Ad Club, Stalwarts," or "Gang No. 3, Portland Realty Board, We will ROCK the Earth." The highway received much patronage, although some citizens were less than enthusiastic about its construction. Opponents showed their views with placards declaring, "I WON'T WORK, To Hell With Good Roads, We Don't Own Autos." Many "mossbacks" had no use for good roads and were satisfied

traveling the network of rutted, narrow, steeply-graded backwoods trails. Nevertheless, the public generally supported the highway's construction. Multnomah County Commissioners levied a direct tax sufficient to fund road building to the Hood River County line, and subsequently, the people voted a $1 million bond issue to pave the road with asphalt.[6]

Other counties similarly supported the scenic highway innovation. In 1914, Hood River County voters approved the sale of $75,000 in bonds to initiate their portion of the road's construction. Finally, in 1915, Wasco County commissioners financed a survey to locate the route through their jurisdiction. By 1916, though, the state highway commission was reorganized and given a greater mandate over state highway construction, taking much of it out of local hands. Passage of the Federal Aid Road Acts of 1916 and 1921 gave the Oregon State Highway Commission matching funding to complete the HCRH through Wasco County, and eventually to complete the route to its eastern terminus at Pendleton, in Umatilla County, by the early 1920s. At the same time, the state, working with counties west of Portland, completed another portion of the Columbia River Highway to the sea at Astoria. Eventually it became part of the national highway system and was designated part of U.S. 30.[7]

By the late 1930s, construction of Bonneville Dam, a New Deal project aimed at providing flood control on the Columbia River and generating electricity, caused a realignment of a portion of the HCRH near Tooth Rock and Eagle Creek, in eastern Multnomah County. It was evident that the old highway was too outdated to provide safe efficient travel for modern motor traffic. By 1954 it was bypassed in its entirety from Troutdale to The Dalles by a new water-level route. This new road was subsequently upgraded to a four-lane divided roadway and eventually renamed Interstate 84. Only portions of the old route remained as a reminder of its early modern highway engineering accomplishments.

BRIDAL VEIL FALLS BRIDGE

Multnomah County built the Bridal Veil Falls Bridge, slightly over a mile east of Shepperds Dell Bridge, in 1914 as part of the first phase of construction on the Columbia River Highway east from Portland. It was one of several structures built to span streams in the "waterfalls section" of the road between Latourell and Horsetail Falls. Bridal Veil Falls, immediately downstream from the bridge, were named for their resemblance to the veil of some giant's bride, according to one newspaper account. It is unknown when this cataract received its

name. Lewis A. McArthur, author of *Oregon Geographic Names* wrote that "The romantically inclined never fail to name at least one important waterfall in a state Bridal Veil."[8] The creek that forms this falls begins on nearby Larch Mountain. Bridal Veil Falls and nearby picnic areas and lodgings have been popular recreation sites since the HCRH's construction.

The town of Bridal Veil dated from the early 1880s when the Bridal Veil Lumbering Company established a planing mill there. Rough lumber for the mill was cut at the logging camp of Palmer, on Larch Mountain, high above the Columbia. Flumes with water supplied by Bridal Veil Falls Creek carried the rough-cut lumber from Palmer to Bridal Veil where it was finished as flooring and other products and then shipped out on the Oregon-Washington Railroad and Navigation main line. In 1914, the HCRH pushed through the Bridal Veil area, crossing Bridal Veil Falls Creek and three lumber company flumes directly above the falls. The road changed the local community's character by ending its dependance on rail and river traffic. The flumes were last used in 1936 shortly before the Kraft Cheese Company purchased the planing mill and used it to manufacture cheese boxes. During the Second World War, the workers at Bridal Veil constructed ammunition boxes. Since the late 1950s, the mill has changed hands several times and has had a variety of functions.[9]

A few early residences in the Bridal Veil area remain. One, the Bridal Veil Inn, a frame two-story rectangular building with a log-beamed ceiling, has continually provided lodgings, first for mill workers in the 1910s and later for travellers on the HCRH. Other homes were constructed as a consequence of the HCRH running through the area. These include Forrest Hall, a large 2½ story Colonial Revival frame house with a front portico, which dates from the time of the HCRH's construction. For years its owners served Southern-style dinners to travelers on the highway. Another was the Jacobson Estate, at the nearby Coopey Falls. Designed by well-known Portland architect Morris H. Whitehouse in 1916 as a "Italian Villa," its rock-walled gardens and creek were built by the same Italian masons who created the masonry walls on the HCRH.[10]

DESIGN AND DESCRIPTION

In bridging Bridal Veil Creek, Billner encountered several problems that determined the type of structure that he designed. In addition to spanning the creek itself he was required to create a bridge that also crossed a dam and three flumes. The bridge site could not be changed because large mill yards occupied all available space between the waterfalls and the OWRN tracks. In addition, topography east of the creek prevented a

realignment of this section of the HCRH. Further, the lumber company stipulated in its granting of right of way that the flumes would not be modified to accommodate the bridge. Billner needed to consider these constraints in designing the bridge, as well as other general concerns about building bridges on the HCRH. In 1914 he wrote that the overriding factors in designing bridges for the road were "safety and low cost." In addition, Billner wrote that "there has been a constant aim toward the artistic, and an effort to reach a state of harmony with the surroundings. This latter consideration made the adoption of a standard type impossible."[11]

The Bridal Veil Falls Bridge is a skewed 110' reinforced-concrete deck girder span in which the guard fences serve as continuous beams. The transverse deck support members on this structure function as deck girders. Width out-to-out is 23'-2", curb-to curb is 21'-0". Each pair of diamond-shaped 24' main piers is connected by a continuous footing resting on rock. They were offset to accommodate the northeasterly flow of the creek and maintain a 6-foot-high clear channel for the lumber flumes. In addition, while the main span appears to measure 60', in reality it consists of three spans measuring 15'-0", 30'-0", and 15'-0". In order to maintain minimum flume clearances, Billner had to design two sets of intermediate piers that broke away 30° from the vertical and connected near the bases of the main piers (a third set for a 15' approach span was done the same way). They appear to the casual observer as simply diagonal bracing. Finally, according to Billner, he designed the 20"-thick parapet walls running the length of the bridge to carry loads to the columns, calculating them as "elastic beams resting on many supports."[12]

Reinforcing consisted of ⅜" to 2¾" square steel bars. Twenty-inch deck beams were placed 10'-0" on center throughout the west approach and main spans and at 7'-6" in the west approach span. Finally, the elevation sides of the parapet walls have seven bushhammered inset panels. The walls are continuous because of their function as elastic beams, so this detail was purely for decoration.

The Pacific Construction Company built this bridge in 1914 at a cost of $5,095.28 It was one of several that this contractor constructed along the waterfalls section of the HCRH. The others included the West and East Multnomah Falls viaducts (HAER Nos. OR-36-G and OR-36-J), the Multnomah Creek Bridge (HAER No. OR-36-H), and the Multnomah Falls Footbridge (HAER No. OR-36-I). The Bridal Veil Falls Bridge was constructed without mishap except for a settling of falsework that caused one of the girders to deflect. Nevertheless, K. P. Billner was confident that he

could conceal this noticeable irregularity in the structure's construction and that it would in no way compromise its load carrying abilities.[13]

REPAIR AND MAINTENANCE

Maintenance files for the Bridal Veil Falls Bridge no longer exist and recent inspection reports were unavailable. It has been in continuous service on the HCRH since completion in 1914.[14]

ENDNOTES

[1]For good syntheses of the Pacific Northwest good roads' movement, see John Kevin Rindell, "From Ruts to Roads: The Politics of Highway Development in Washington State" (M.A. thesis, Washington State University, 1987) and Hugh M. Hoyt, Jr., "The Good Roads Movement in Oregon, 1900-1920" (Ph.D. diss., University of Oregon, 1966); Oral Bullard, *Lancaster's Road: The Historic Columbia River Scenic Highway* (Beaverton, OR: TMS Book Service, 1982), 31; Ronald J. Fahl, "S. C. Lancaster and the Columbia River Highway: Engineer as Conservationist," *Oregon Historical Quarterly* 74, no. 2 (June 1973): 112.

[2]Fahl, "S. C. Lancaster and the Columbia River Highway," 105-07.

[3]John Arthur Elliott, "The Location and Construction of the Mitchell Point Section of the Columbia River Highway" (C.E. thesis, University of Washington, 1929): 3.

[4]Samuel C. Lancaster to Amos S. Benson, 7 February 1914, folder "Multnomah County, 1914," box 4, RG 76A-90, Oregon State Archives, Salem.

[5]Dwight A. Smith, "Columbia River Highway Historic District: Nomination of the Old Columbia River Highway in the Columbia Gorge to the National Register of Historic Places, Multnomah, Hood River, and Wasco Counties, Oregon" (Salem, OR: Oregon Department of Transportation, Highway Division, Technical Services Branch, Environmental Section, 1984): 3.

[6]Ronald J. Fahl, "S. C. Lancaster and the Columbia River Highway: Engineer as Conservationist," *Oregon Historical Quarterly* 74, no. 2 (June 1973): 111; Samuel C. Lancaster, "The Revelation of Famous Highways: A Symposium,"in *American Civic Annual* (n.p., 1929): 109.; see photograph in the Oregon Historical Society collection, negative no. 38744; C. Lester Horn, "Oregon's Columbia River Highway," *Oregon Historical Quarterly* 66, no. 3 (September 1965): 261.

[7]*Second Annual Report of the Engineer of the Oregon State Highway Commission* (Salem, 1916): 26-30.

[8]"*Journal* Journeys, 42--Bridal Veil and Coopey Falls," *Oregon Journal* (12 June 1916): 6; Lewis A. McArthur, *Oregon Geographic Names*, 6th ed., revised and enlarged by Lewis L. McArthur (Portland: Oregon Historical Society Press, 1992): 94-95; [untitled manuscript by K. P. Billner] in folder "Multnomah County, 1914," box 4, RG 76A-90, Oregon State Archives, Salem, 1.

[9]"*Journal* Journeys, 42--Bridal Veil and Coopey Falls"; "Bridal Veil," in "Columbia River Highway: An Inventory of Historic Sites," Columbia River Highway Project (Cascade Locks, OR: 1981): n.p.

[10]"Bridal Veil Inn and "Forrest Hall (Maxwell House)" in "Columbia River Highway: An Inventory of Historic Sites," Columbia River Highway Project (Cascade Locks, OR, 1981): n.p.; "The Jacobson Estate," in *Gorge Views: A Newsletter of the Crown Point Country Historical Society* 95, no. 8 (June 1995): 8.

[11]"The Columbia River Highway in Multnomah County," by Samuel C. Lancaster, Consulting Highway Engineer, Assistant Highway Engineer, in *First Annual Report of the State Highway Engineer* (Salem, 1914): 62; "Reinforced Concrete Bridges on the Columbia Highway in Multnomah County," *First Annual Report of the State Highway Engineer* (Salem, 1914): 188; [untitled typed manuscript by K. P. Billner] in folder "Multnomah County, 1914," box 4, RG 76A-90, Oregon State Archives, Salem, 5-6; K. P. Billner, "Design Features of the Various Types of Reinforced Concrete Bridges Along the Columbia River Highway in Oregon," *Engineering and Contracting* 43, no. 6 (10 February 1915): 123. In the Bridal Veil Falls Bridge the following quantities of material were used: 289 cubic yards of Class A (1:2:4) concrete and 12 tons of reinforcing steel. See "Exhibit B, Reinforced Concrete Bridges," *First Annual Report of the State Highway Engineer* (Salem, 1914): n.p.

[12]Billner, "Design Features of the Various Types of Reinforced Concrete Bridges Along the Columbia River Highway in Oregon," *Engineering and Contracting* 43, no. 6 (10 February 1915): 123; "Reinforced Concrete Bridges on the Columbia Highway in Multnomah County," *First Annual Report of the State Highway Engineer* (Salem, 1914): 188; [untitled typed manuscript by K. P. Billner] in folder "Multnomah County, 1914," box 4, RG 76A-90, Oregon State Archives, Salem, 5-6; "Reinforced Concrete Bridge over Bridal Veil Creek," Drawing No. 294, in Bridge 823, Maintenance Files, Bridge Section, ODOT, Salem.

[13]See separate HAER historical reports for the other bridges. "Reinforced Concrete Bridge over Bridal Veil Creek," Drawing No. 294, in Bridge 823, Maintenance Files, Bridge Section, ODOT, Salem; *First Annual Report of the State Highway Engineer* (Salem, 1914): 50; K. P. Billner, Resident Engineer, to Pacific Bridge Company, 6 August 1914, in "Columbia River Highway, K. P. Billner, Resident Engineer, 1914," 2/21; and [Billner] Resident Engineer to S. C. Lancaster, Consulting Engineer, [date illegible], "Columbia River Highway, Bridges--Miscellaneous,

1914-1916," 2/24, both in Multnomah County Roadmaster Records, Mss 2607, OHS.

[14]A thorough search of records in the Bridge Section of the Oregon Department of Transportation in Salem yielded a maintenance file devoid of records. The only item found was one original construction drawing.

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DATA LIMITATIONS

Research materials on the Bridal Veil Falls Bridge came predominantly from correspondence files, state highway department reports, and trade journal articles. The Oregon Department of Transportation maintenance files only yielded an original ink-on-linen measured drawing of the bridge. Recent inspection reports were unavailable.